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ABSTRACT

Currently, there is not a single university medical center in which an acceptable routine system to assure quality of care has been established. This may result from reliance on the structure of the medical education process as a proxy measure to assure that physicians perform appropriately in their role. Several studies have been conducted to determine quality of care at both university and community hospitals; the results emphasize a need for immediate implementation of a controlled quality assurance system. This system should include a "uniform hospital discharge abstract," noting patient characteristics, diagnosis, procedures, length of stay, patient's condition at time of discharge, and physician. The system should be coupled with a series of routine studies which examine the process and outcome of care for selected patients. A quality assurance system based on the statistical data from these studies is the only way the deficiencies of medical education can be validly and reliably identified. (NE)

Quality of Care Assessment:
The Role of Faculty at Academic Medical Centers

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When I was asked to present a paper at this meeting I was told that it must meet the following requirements. First, it must be stimulating and witty. Second, it must bebright and innovative. Third, it must contain information which you could, so to speak, take home with you and implement in your daily activities. Fourth, in order to measure the quality and efficacy of this speech, a follow-up examination of all academic centers would be undertaken to determine if anything I said here today was actually implemented or resulted in the implementation of any component of any quality assurance activity in any medical school. Considering the above requirements, the only reason that I accepted this responsibility is that I am a physician and that makes me slightly masochistic, and I have spent eight of the last nine years at Johns Hopkins and the last year serving the United States Government and that certainly qualifies me for a place in a mental or some other type of institution.

It is doubtful that I will be able to accomplish any of the above requirements. However, I hope to at least challenge you to think about this subject in a practical as opposed to theoretical manner; and to plead with you to spend your effort in attempting to install, evaluate and publicize a quality assurance system in your own academic institution instead of raticnalizing away its need by stating that care in community hospitals is inferior to that provided in university hospitals, and that only the former is in need of a quality assurance system.

In my one attempt to be witty, I would like to begin the substance of my talk with a quote from Robert F. Mager.

"There once was a teacher,
  Whose principal feature,
Was hidden in quite an odd way.

Students by millions,
  Or possibly zillions,
Surrounded him all of the day.

When finally seen,
  By his scholarly dean,
And asked how he managed the deed.

He lifted three fingers,
  And said, all you swingers,
Need only to follow my lead.

To rise from a zero,
  To Big Campus Hero,
To answer these questions you'll strive:

Where am I going,
  How shall I get there, and
How will I know I've arrived?

In this era of supposedly rapid innovation and change, I would like to add a few more questions to Dr. Mager's list. Those questions are, "Where have I been, what do I know, and why must I persist in rediscovering the wheel?"

Around 1870, over a century ago, Florence Nightingale proposed a registry for all surgical operations. Variables included in this registry would have been age, sex, and occupation of patient, disease leading to the operation, date and nature of operation, constitution of patient, complications occuring after operation, date of recovery from operation, and the reason for the occurence of any complication following the operation. Examination of this list of variables suggests that Nightingale appreciated the need to collect

information about what happened to a patient following his operation instead of just collecting information about what the physician did for the patient.

About forty years later, Groves,[2] a surgeon in Great Britian issued a plea for the uniform registration of results of operations. The basis of this plea was: "If a surgeon makes a specialty of some disease or operation and tabulates all of his own results or another by chance has some notable successes and records them, or the author of a textbook collects published records of various writers and summarizes them, is it not obvious that such a collection of figures will represent the best and not the average result?" In order to obtain information about the average results, Groves conducted a survey of the 50 hospitals in Great Britian with over 200 beds. He received replies from 27 hospitals. Results of this survey showed that there was a 44 percent operative mortality from radical operations from malignant diseases of the stomach, 24 percent mortality from radical operations from malignant diseases of the rectum, 24 percent mortality from prostatectomy, and a 9 percent mortality from an operation to cure appendicitis.

In the early 1910's, Codman,[3] a surgeon at the Massachusetts General Hospital was lamenting: "one might say that the instruction of the student is irrespective of the results to the patients, but let us suppose, in surgery, for example, that all of the operations which have been watched by these students have been misdirected efforts at the cure of disease, and that students have learned to do something which is not worthwhile and does not really improve the patient. The

product of the hospital in this case, even as regards student instruction, would be nill, even worse than nill. We are, therefore, referred again to the classification of disease and the results to the patients, because the student would naturally wish to receive his instruction in a hospital where the treatment was shown to be of benefit to the patient. We may then, say that the number of cases treated, depends on whether or not the cases are well treated."

"The publication of medical and surgical papers by members of our profession is a very interesting phenomenon. We are like boys throwing pebbles into a pond. Some stones fall without even a splash, producing only the peculiar sucking sound which we used to call 'cutting an egg'. Other splash, wake up the pond for an instance, and send out more or less widening circles, which fade away entirely or leave little ripples which nobody recognizes as belonging to the original splash. Occasionally some apparently dull boy, when our backs are turned or when we are busy watching our own circles, throws in a hugh rock which starts an enormous wave, and we all throw in a stone in a hurry and try to think that we made the wave ourselves. As much of truth as there is in our own efforts, coincides with and reinforces the wave until even its author is appalled by its size."

In an effort to seek solutions to the above problems, Codman attempted to institute a follow-up system at the Massachusetts General Hospital. The objective of this system was to raise his own level of performance by examining all the patients on whom he had operated, one year post-operation. From the information to be gathered at this examination, Codman determined whether or not the operation which was performed was indicated and if it

had improved the patient's symptoms. After being thoroughly frustrated in these efforts to establish a follow-up system at the Massachusetts General Hospital, he resigned his position as Professor of Surgery and started his own hospital in which he instituted such a follow-up system. Every patient on whom he had operated was recalled a year later and his health reassessed in terms of the original objectives of the initial operation. From this assessment, Codman determined whether his original diagnosis was correct, his operation was a technical success, the patient benefited from the operation, or whether he had produced some untoward or iatrogienic effect by operating on this patient. Codman also recognized the need to aggregate the data from these cases and to accomplish this task he developed a sophisticated punch-card system.

But why should I bore you with this historical rendition of work which occurred at the turn of the century? The answer to this rhetorical question is relatively straightforward. Since the time of Codman in the 1910's very little progress has been made either in advancing the state of the art of quality assessment or in instituting a quality assurance system in academic medical institutions. Whatever progress has occurred has been the result of courageous efforts by medical care foundations, medical societies, and "odd-balls" in the medical centers. In general, work of this type has not been supported by deans of medical schools, or by professors of medicine or of surgery. Yet over sixty years ago the basic principles of a quality assurance system were clearly delineated by a respected professor of surgery at a world famous medical institution.

The basic principles of such a system are: first, the collection of

valid and reliable statistical data concerning both the performance of the provider and/or institution and the results experienced by the patient. Second, sombody must examine and interpret these data against some type of criteria and standards and then in a cyclical manner return these results to the responsible provider or institution. Third, the structure at the institution must be mobilized in order to, when and where, necessary, select and then institute, using an appropriate method, the needed changes.

In 1916 in Dr. Codman's end results hospital, all three of these tasks had been accomplished. Upon reading the literature of this period, one would have predicted that within a time span of ten to fifteen years, this type of quality assurance system would have been accepted in most American hospitals: especially in those hospitals in which the leaders of American medicine existed--the university academic center. However, except for the work of a few investigators,the movement started by Codman and Nightingale became in the next 50 years virtually extinct.

The question can be raised as to why this occurred. No adequate answer is available, but one possible explanation is that the death of the outcome movement of the 1910's was a counter productive result of a misinterpretation of the Flexner report.[4] This report, by highlighting the inadequacies of medical education in the United States in the early 20th century, led to important changes in the structure of medical schools. After making these changes, important personnel at medical schools could confront the critics of these institutions with evidence of this change and state, that it was self-evident, that since the structure and content of medical education wereso nearly "perfect" it was superfluous to develop a quality assurance system. This reliance on the structure of the medical education process as a proxy measure to assure that the product of the medical

education process, the physicians, performed appropriately in their role, may have been a fundamental reason why very little work in quality assessment and assurance field occurred in the next half century.

Presently, professors, deans and other physicians in the university medical centers are in an embarrassing position. While the university medical center has maintained its leadership role in helping practitioners outside it, diagnose and treat patients with complex clinical problems, in the field of quality assessment and assurance, these same university personnel must make a major effort if they are just to catch up with the progress which has been made outside the medical center. Currently, there is not a single university medical center in which an acceptable routine system to assure quality of care has been established. Yet there are a number of medical foundations which have begun to implement such a system. If this lack of knowledge and initiative were not enough, there also appears at times to be an aura of aloofness at these centers which is often expressed as follows: We know our care is good. We know we train good doctors. We know the costs of our care are justified. Therefore, we do not need to examine what we are doing.

Yet these same individuals that seem willing to accept the above statements as truisms, vigorously debate the validity of minute hypotheses concerning the underlying pathogenesis and etiology of disease. In order to increase knowledge about disease, they are quick to argue for the application of the scientific method in its most rigorous form in all of these investigations. However, in the area of quality of care assessment they, instead of demanding rigorous scientific investigation, are willing

to accept as proof of good quality of care: (1) information categorized as clinical judgment; (2) the opinion of the leaders at the center; and (3) generalizations derived from the detailed examination of a biased sample of individual cases such as those presented at a clinical pathologic conferences.

Before proceding to describe what type of quality assurance system could be implemented in academic centers, it may be useful to end the above discussion with a review of the few studies in the area of quality of care which have been performed at academic centers. A study conducted in Great Britian examined post operative mortality from prostatectomy in both teaching and community hospitals. The unadjusted case fatality rate was lower in teaching hospitals. It was also observed that the sickest patients, i.e., such as those patients who had acute urinary tract obstruction, were operated on in community hospitals, since they were too sick to travel to the teaching hospital. After controlling for this factor, the mortality from the operation at the teaching hospitals was similar to that in the community hospitals.[5]

Dr. Inui,[6] who is now chief resident at the Johns Hopkins Hospital, carried out a study which examined the quality of care given by the house staff in the ambulatory care department to patients with essential hypertension. The purpose of the study was to determine if he, by conducting a short educational session with the house staff, could improve the quality of care rendered to hypertensive patients. The study was designed as a controlled clinical trial with the selection of both experimental and control house staff and with the collection of before and after data. The control house staff received the usual and customary education in this disease while the experimental house staff received an additional educational

input consisting of the theoretical problems of managing a hypertensive patient and an examination of all the statistical data collected in the before period concerning how patients with hypertension were actually being treated in this hospital. The study produced two interesting findings: (1) as measured in terms of the percentage of patients with a controlled blood pressure at the time of the follow-up examination, the quality of care given by the house staff in the experimental group was statistically as well as clinically much improved; and (2) the behavior of the control house staff as measured by their ability to control their patient's blood pressure had not improved by the end of the study period even though they had been exposed to nine months of training. In this small study, in need of replication, Dr. Inui has questioned the value of the customary education process, commonly called house staff training. The tragedy of this study is not contained solely in its results. Instead, questions must be asked such as: How can we teach house officers to become good internists without collecting this information? Why did it take so long to perform a carefully designed scientific study like this one? How can we make it easier to conduct similar studies in academic centers? and Why did a second year resident perform this study as opposed to a professor of medicine?

Other small studies which have assessed the quality of care in academic centers have been performed. A study conducted at the Johns Hopkins Hospital demonstrated that 75 percent of patients presenting

to the emergency room with upper-gastrointestinal complaints received inadequate care.[7] A study performed in a university hospital in the eastern part of the country demonstrated that 20 percent of all patients who had an elective partial gastric resection for an uncomplicated gastric ulcer, died. This figure should be compared to mortality statistics in the literature which suggest that from two to five percent of the patients were expected to die.[8] This same university's gastrointestinal service also observed that only one-third of all of their gastric ulcer patients had sufficient follow-up to ascertain whether their ulcer had healed, yet this is the most importatn procedure to be done in caring for these patients.

The quotation of these studies is not meant to indicate that care, in general, is poor in university hospitals, or is worse than that given in community hospitals, but only to indicate that there are serious problems in the delivery of care and that these problems exist even in university hospitals. These problems will not be solved if they are not studied and identified and this requires the development of a quality assurance system. This system must encompass medical students, house-staff, full-time and part-time faculty. The system must be carefully evaluated and it must be based on appropriate statistical data relating to the performance of an individual or a ward or a clinic. It should be supplemented by analysis when appropriate, of individual cases. This is exactly opposite to the current non-system which exists today, which is based on examination of individual cases at clinical pathologic conferences, mortality or morbidity conferences, tissue committees, and ad hoc chart reviews. Even if these conferences examined the right problems which

they don't, i.e., emphasis is on examination of patients who were so sick that they would probably have died irregardless of the quality of medical care provided, instead of on examination of preventable morbidity and disability, they can also be easily sabatoged. For example, if a house officer felt that he had made a mistake in a patient which partially resulted in his demise, he then could avoid having the patient discussed at mortality conference by not pressing the family for an autopsy.

After spending a considerable amount of time describing where we are, the question of what to do next seems appropriate. I suggest that the implementation of a quality assurance system should begin with the installation of the uniform hospital discharge abstract.[9] This abstract to be completed on all hospitalized patient contains the following information; patient characteristics such as age, sex, race, place of residence; diagnosis; procedures; length of stay; condition of the patient at time of discharge, and physician or physicians responsible for caring for the patient. This information could easily be linked to hospital charges. Analysis of these data would begin to provide basic information concerning differences in case fatality rates, utilization rates, and length of stay.

In an academic center in which responsibility for training young physicians is paramount, this system needs to be coupled with a series of routinely performed epidemiologic studies which examine for selected patients both the process and outcome of care. This type of system could be implemented immediately and should provide answers to important questions. However, in order for it not to produce nonsense information, medical

students and house staff must be instructed in the need to code diagnostic and procedural information carefully. Otherwise the current situation in which the computer spews out beautifully labeled garbage will persist.

If such a system was adopted, the following types of information vital to medical education and assessing quality of care would be available. A chief resident who has finished his surgical training would know his true positive and false positive diagnostic rate for patients who present with symptoms of appendicitis. He would be able to determine how his work compares to his superiors and, if necessary, be able to determine how he could improve his performance. The young internist through the statistical examination of his ability to control blood pressure of patients with hypertension could learn before it is too late to change bad habits concerning how he relates to patients with chronic diseases.

This system could identify the number of abnormal tests not followed up and appropriate use of this information could alter sloppy behavior patterns before they become codified into hardened cement. Specific questions such as variation in the survival rate from recessitation efforts in the emergency room or the case/fatality rate from acute myocardial infarction could be studied as a function of system and provider variables. The appropriateness of laboratory use could be examined. For example, what is a routine workup for children with fever? How does the fever workup compare with that performed by pediatricians in private practice? Does the number of tests vary with whether the house officer or the

laboratory performs them? How many significant positive findings are there? How does the fever workup affect the patients outcome?

This problem list which could become the basis of a quality assurance system could be expanded almost ad infinitum. It doesn't require any great mind to list these problems, nor does it require any great mind to begin to systematically investigate them. It does, however, require that this type of activ.ty become politically legitimized in a university medical center. It must become an integral part of house-staff and medical student education with both groups participating in designing and performing these types of studies and in examining and interpreting their results. It means inculcating into house staff and medical students the critical notion that their ability as a physician is more related to and will be measured by how they perform and what happens to their patients instead of by how well they can cram for examinations and/or impress their attending physician on rounds.

Finally when deficiencies in performance are discovered,and they will be virtually every time, a careful analysis of the possible explanations must be sought. Many times it will be discovered that it will be necessary to change system variables instead of provider behavior. As these changes are made they must be implemented in an experimental fashion so that it can be ascertained whether or not they have worked. One of the great tragedi of modern medical education is that after all the effort and countless professional hours that has been consumed by meetings on curriculum reform, there is not any valid information to determine how this movement has affected physician performance. I hope that all this effort spent on curriculum reform has not been wasted either by adopting the wrong

solution or by addressing the wrong question. I would think that you would be interested in the answer to this question, but a valid answer would have required a prospectively designed series of studies instead of retrospective wishful thinking.

A quality assurance system based on aggragated statistical data concerning the processes and outcomes of care is the only way in which the deficiencies of medical education can be reliably and validly identified. Development of such a system will not require any great intellectual or methodologic breakthrough, but it will require the same obsessive complusive behavior that exists in other areas of the medical school. The implementation of such a quality assurance system will make possible a fairer and more valid measurement of the ability of a medical student or house officer. In the long run it will render a justifiable death to boards, recertification programs based on attendence at seminars in Europe, and those continuing educational courses conducted at most academic centers for the sake of the ego of the teacher instead of for the benefit of the practitioner of medicine. The clinician, provided that he has the innate ability to teach and relate to people, who masters the intricacies of the quality assurance system will be an outstanding clinician and a superb teacher. He will possess the information base from which he could author more valid and useful medical textbooks. He will have the knowledge to answer those three simple questions which currently defy answering:

"Where am I going
How shall I get there, and
How will I know I've arrived?"

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